Before The
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Spectrum Policy Task Force Report	)	WT Docket No. 02-135
	)	

REPLY COMMENTS OF VERIZON WIRELESS

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INTRODUCTION AND SUMMARY

In accordance with the Commission's Public Notice of November 25, 2002, Verizon Wireless respectfully submits these reply comments in response to the FCC's Spectrum Policy Task Force Report.[1] Responding to hundreds of comments and information generated during several days of public workshops, the Task Force performed the immense task of systematically evaluating existing spectrum policies and making recommendations as to possible improvements.[2] The Commission must now consider the merits of these recommendations and decide on the future direction of spectrum management policy.

The underlying goal of the Task Force was to identify public policies that will promote access to and use of the radio spectrum. After extensive study, the Task Force concluded, not surprisingly, that the Commission should "evolve its spectrum policy toward more flexible and market-oriented spectrum policies that will provide incentives

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[1] *Commission Seeks Public Comment on Spectrum Policy Task Force Report*, FCC Public Notice, 02-322, rel. Nov. 25, 2002; *Spectrum Policy Task Force Report* (ET Docket No. 02-135), rel. Nov. 15, 2002 ("Task Force Report").

[2] *See gen.* Task Force Report.

for users to migrate to more technologically innovative and economically efficient uses of spectrum."[3] Moreover, the Task Force identifies several key elements that should be included in the Commission's spectrum policies and provides a road map, albeit a preliminary one, to achieve the Commission's objectives.

Verizon Wireless believes that the critical component of this transition to market-oriented spectrum policies is strengthening the "exclusive use" model of spectrum licensing. We agree with those commenters that state that a functioning market depends fundamentally on a clear definition of underlying spectrum rights, and that the best way to promote the introduction of innovative wireless services, including wide-area mobile and broadband services, is through the use of licensed spectrum that is both flexible and assigned exclusively for use by a given licensee.[4] As Arraycom notes, "before concepts such as the use of transient "white spaces" in licensed bands, "underlays" and easements are considered, the rights and responsibilities of spectrum licensees must be clarified."[5]

In addition, in its march toward a more market-based spectrum management system, the Commission cannot override its core spectrum management obligations to manage interference, and should not devalue existing licensees' services.

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[3] Task Force Report at 15.

[4] *See* Commments of Arraycom, Inc. (filed Jan. 27, 2003) ("Arraycom Comments"), in response to Task Force Report, at i.

[5] Arraycom Comments at 6 (footnote omitted). "Any rights conferred upon the unlicensed sharer must not devalue or impair the licensed user's operations, the ability to guarantee service quality, for example."

While we applaud the Commission for its efforts to seek spectrum for new services,[6] and appreciate that, in theory, the application of market principles to spectrum management could result in additional sources of spectrum, we urge the Commission not to support the introduction of new wireless services at the expense of existing ones. Damage to existing services can occur both through harmful interference to existing licensees, as well as by restricting existing licensees' ability to flexibly evolve its use of the spectrum as the marketplace demands.

Verizon Wireless agrees with the many commenters that find the proposed "interference temperature" concept neither workable nor practical. Using an interference temperature as a proxy for meeting the Commission's obligations to manage interference would improperly rely on the operation of spectrum-sharing technologies that do not yet exist, and would likely lead to the degradation of existing systems. Furthermore, interference temperature and the "underlay" model proposed by the Task Force are conceptually at odds with the important principle of "exclusive use." They could seriously affect the manner in which licensees innovate and make use of their assigned spectrum, and in the aggregate, will fail to meet the Commission's statutory obligation to promote innovation and efficiency.

It seems odd that after proposing to systematically and exhaustively define a licensee's rights, the Task Force would recommend an approach to interference management that could create a significant potential for harmful interference and thus

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[6] *In the Matter of Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, including Third Generation Wireless Systems ("3G Proceeding")*, FCC 02-304, Second Report and Order (ET Docket No. 00-258) (2003).

compromise those rights and the benefits they bring to efficient spectrum use that best serves the public interest. The Commission should be wary of such an approach. While the Commission may find it beneficial to promote the introduction of new unlicensed devices, it should not do so at the risk of harming licensed services.

This does not preclude the Commission, however, from allocating additional spectrum for unlicensed use, if there is a demonstrated need. However, spectrum allocated for unlicensed devices should be separate from that allocated for the "exclusive use" of licensed operators.

I. THE COMMISSION MUST ACT PROACTIVELY TO DETER HARMFUL INTERFERENCE.

Verizon Wireless commends the Task Force for placing a high degree of importance on interference issues. As many commenters have noted, limiting the potential for harmful interference is at the very core of the FCC's spectrum management responsibilities.[7] One of the fundamental reasons for issuing radio licenses, pursuant to Section 301 of the Communications Act, is to control interference.[8] Section 303 of the Act specifically requires the Commission to establish rules that will "prevent interference between stations."[9] If the Commission does nothing else as a result of the Task Force's significant efforts, it must act vigorously to ensure that licensees are not subject to

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[7] *See* Comments of Comsearch (filed Jan. 27, 2003) ("Comsearch Comments"), in response to Task Force Report, at 2; *see also* Comments of Cingular Wireless LLC (filed Jan. 27, 2003) ("Cingular Comments"), at 2.

[8] *See* 47 U.S.C. § 301.

[9] *See* 47 U.S. C. § 303(f).

harmful interference.[10] Such action is necessary to ensure that the availability and reliability of existing services are not diminished and limited resources are not diverted to interference mitigation.

As a preliminary matter, we are concerned that the Task Force's recommendations on various interference principles appear to be focused on promoting the introduction of new spectrum uses, rather than on protecting existing services. We appreciate the importance of promoting new services and new uses of the radio spectrum. However, we agree with other commenters that the interest in promoting new services "does not justify technical decisions that seriously degrade an incumbent licensee's services."[11]

A. Interference Can Have Many Harmful Effects On Commercial Mobile Radio Services.

It is important for the Commission to understand the harmful effects that interference can have on CMRS and other licensed services and that it enforce its rules to ensure that harmful interference does not occur. In this regard, there is often disagreement on what level of interference is considered "harmful." The Commission's rules define "harmful interference" to include any interference that "seriously degrades, obstructs, or repeatedly interrupts a radio communications service operating in

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[10] Verizon Wireless has been working with AT&T, Cingular, and V-Comm L.L.C., a telecommunications consulting company, to evaluate the technical aspects of the Task Force Report and to assess the impact of interference to commercial mobile radio service ("CMRS") licensees. V-Comm's findings are included in its Reply Comments, filed coincidentally with this filing. *See* Reply Comments of V-Comm, L.L.C. (filed Feb. 28, 2003) ("V-Comm Reply"), in response to Task Force Report.

[11] *See* Sprint Corporation Comments (filed Jan. 27, 2003) ("Sprint Comments"), in response to Task Force Report, at 11.

accordance with the Radio Regulations."[12] Verizon Wireless believes that this definition is an adequate starting point to cover the variety of ways in which interference can degrade a radio service or the communications network on which it resides. For example, the term "harmful" is not limited to interference that interrupts a particular radio communications or prevents such a communications from being initiated. It also includes degradation of the quality of the service provided and the overall ability of the radio network to provide service to all of its users.

Within a cellular network, interference can have a number of harmful effects. Communications may be interrupted resulting in dropped calls or a failure to successfully handoff a call to an adjacent cell. Interference can prevent communications from being initiated due to reduced coverage in weaker signal areas (such as rural areas or inside buildings). The quality of voice calls may be diminished, while data services may experience decreased throughput and reliability or an increase in latency. Network capacity may be significantly reduced. And, location-based services, such as E-911, may experience problems in accurately determining the location of the caller. Each of these interference effects would result in substantial harms to CMRS customers and operators. Some would require substantial costs to resolve, while others could not be corrected at all. In either case, they would affect an operator's ability to provide the highest quality and most cost effective service to its customers.

[12] *See* 47 C.F.R. § 1.907.

B. The Commission Must Make A Distinction Between "Internal" And "External" Interference.

Verizon Wireless and other CMRS operators deal with interference on a daily basis. Within the cellular network, each caller's transmission potentially interferes with every other caller's transmissions. Since this interference is generated within the cellular network, it is referred to as *self* or *internal interference*. We employ a variety of tools and techniques to control, manage, mitigate and resolve internal interference.

The system is designed to provide effective coverage that ensures adequate network capacity while reducing the potential for interference from adjacent cells. Handoff and access protocols are designed to ensure that the mobile phone communicates with the closest base station, thus minimizing internal interference.

In CDMA networks, the transmit power of the base stations and the mobiles are controlled 800 times a second to within 1 dB of the lowest power that is capable of providing adequate service. As a result, the internal noise of the CDMA system is kept to an extremely low level, with signals operating very close to the noise floor. In fact, due to the inherent processing gain of the CDMA system, CDMA receivers have the ability to operate effectively below the noise floor. This is one of the basic principles of a spread-spectrum system, and the manner in which a CDMA system provides increased capacity.[13]

New technologies, such as joint detection, multi-user detection, and interference cancellation, are currently being investigated that will be able to effectively remove most

[13] V-Comm Reply at 19.

of the internal interference present in CMRS systems.[14] These technologies rely on the fact that the statistical characteristics of the CMRS signal are well known to the receiving systems in the network. The internal interference is controlled, time synchronized, and has a known modulation scheme. With these advanced technologies, the system will only be limited by interference that is external to the system and cannot be removed.

Interference sources that are not generated by users of the network and not under the control of the CMRS operator can be defined as *external interference.* The effects of external interference can be quite debilitating to a CMRS network, because CMRS operators do not have the ability to manage or mitigate this type of interference and there is no margin reserved for external interference.[15] If external interference were permitted to occur, the noise floor of the CMRS system would be increased, resulting in reduced coverage, capacity, and/or quality of service.

In its comments, Lucent examines the impact of external interference on the coverage and capacity of a CDMA system.[16] The Lucent study notes that in a typical CDMA reverse link budget, no margin is allocated for external interference. The study demonstrates that when a CDMA system experiences external interference a CMRS operator must face a penalty trade-off between cell coverage and capacity. To maintain call quality at an acceptable level, it is necessary to either reduce cell coverage or reduce the number of customers that the system can support. The examples provided by Lucent

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[14] Cingular Comments at 21.

[15] Because CDMA systems operate below the noise floor, they are particularly sensitive to external interference. The processing gain in a CDMA system is used to provide capacity for the system, and not as a margin to accommodate external interference.

[16] *See* Comments of Lucent Technologies (filed Jan. 27, 2003) ("Lucent Comments"), in response to Task Force Report, at Annex A.

indicate that substantial reductions in cell coverage (30%) or capacity (82%) would result from the introduction of external interference at a level equal to the noise floor of the CMRS base station receiver.[17] As Lucent's study demonstrates, the introduction of external interference to a CMRS system can substantially impact system coverage and network capacity, and the Commission must enforce its rules to prevent such "harmful" effects.

II. THE INTERFERENCE TEMPERATURE AND UNDERLAY CONCEPT, AS PROPOSED BY THE TASK FORCE, IS FLAWED.

Verizon Wireless agrees with the Task Force that the Commission should consider the use of quantitative metrics to augment and clarify its current definition of interference.[18] The application of objective standards to measure interference will assist the Commission in protecting incumbent licensees from interference that is harmful to its current and future operations. However, we agree with the majority of commenters that the "interference temperature" concept, as proposed in the Task Force Report, is flawed in several significant respects.[19]

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[17] *Id* at 4.

[18] Task Force Report at 26.

[19] V-Comm Reply at 7; *see also* Comments of the Cellular Telecommunications & Internet Association (filed Jan. 27, 2003) ("CTIA Comments"), in response to Task Force Report, at 10; Cingular Comments at 17-31; *see also* Comments of AT&T Wireless Services, Inc. (filed Jan. 27, 2003) ("AT&T Comments"), at 9; *see also* Comments of the Telecommunications Industry Association (filed Jan. 27, 2003) ("TIA Comments"), at 8; Lucent Comments at 2; *see also* Comments of Motorola (filed Jan. 27, 2003) ("Motorola Comments"), at 13-14; *see also* Comments of the United Telecom Council (filed Jan. 27, 2003) ("UTC Comments"), at 4; *see also* Comments of The Boeing Company (filed Jan. 27, 2003) ("Boeing Comments"), at 8; *see also* Comments of Lockheed Martin Corporation (filed Jan. 27, 2003) ("Lockheed Martin Comments"), at 6-7; *see also* Comments of the Satellite Industry Association (filed Jan. 27, 2003) ("SIA Comments"),

A. The Interference Temperature Concept Is Impractical And Unworkable.

The Task Force recommends a fundamental shift in the way in which the Commission assesses interference. It suggests the use of real-time data based on the actual RF environment, and recommends the adoption of a new metric, "interference temperature," to quantify and manage interference.[20] The Report notes that different thresholds could be established for each spectrum band, geographic area or service.[21]

The proposal sounds logical and simple enough. However, it ignores the fact that "interference environments are extremely localized and dynamic, and variations are not dependent solely on spectrum band, geographic area, service and technology."[22] The Task Force Report acknowledges that its ability to accurately characterize the RF environment would be difficult, because the universe of interference sources may not be known or anticipated.[23] Moreover, it notes that the certainty with which the RF environment can be estimated "would depend on such factors as transmitter signal ranges, uniformity of signal levels over an area, the density of temperature measuring devices and the sharing of the data taken by nearby devices." However, as TIA notes, such certainty is unlikely to exist, and therefore, "it is questionable whether a single

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at 14-15; *see also* Comments of the Industrial Telecommunications Association, Inc., (filed Jan. 27, 2003) ("ITA Comments"), at 10.

[20] Task Force Report at 27.

[21] *Id* at 28.

[22] AT&T Comments at 11.

[23] Task Force Report at 18.

measure could be practically used over a finite area to accurately describe the noise environment."[24]

The Task Force Report assumes that new "opportunistic" unlicensed devices will be able to "listen" to a particular band to sense whether the interference temperature has been exceeded and whether it is permitted to operate.[25] We agree with the majority of the commenters that question whether such a capability is feasible and practical.[26] It would be difficult, at best, for a device to accurately assess the RF environment simply by performing passive measurements without knowing the locations of all licensed devices.

It is also not clear how the Commission will identify which of these opportunistic devices have exceeded the interference temperature and how it can compel the operators and manufacturers of such devices to remedy harmful interference.[27] The Commission must have a means to enforce the interference temperature requirement before it establishes it as a rule. The Task Force's Report, however, does not correct this serious problem in its proposal. Importantly, once these opportunistic devices are allowed to proliferate, it will be extremely difficult for the Commission to remove them from the RF environment.[28] As a result, the harmful interference that they would cause to licensed services would be substantial and permanent.

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[24] TIA Comments at 8.

[25] Task Force Report at 20-21.

[26] Cingular Comments at 24 and 31; Comsearch Comments at 3.

[27] Lockheed Martin Comments at 7.

[28] *See* Joint Comments of the Association for Maximum Service Television, Inc. and the National Association of Broadcasters (filed Jan. 27, 2003), in response to Task Force Report, at footnote 19.

B. The Interference Temperature Concept Could Degrade The Performance Of Currently Deployed Systems.

The Task Force recommends that an interference temperature be established above the noise floor of licensed spectrum users.[29] However, as discussed supra, CDMA systems operate below the noise floor. Allowing unlicensed devices to operate in CMRS bands up to the interference temperature would raise the noise floor and have a direct and immediate effect on the performance of CDMA systems. Verizon Wireless strongly objects to the proposed "underlay" concept as ill-conceived and in conflict with current technologies.

An increase in the noise floor has the potential to reduce the margin of signal necessary to sustain an adequate communications link, and thus, reduce system coverage. It can reduce the number of customers that can make calls, and thus reduce network capacity. It can degrade the quality of service to our customers, resulting in dropped calls, blocked calls, reduced voice quality, decreased data throughput, and an inability to locate an E-911 caller. The operation of unlicensed devices in an underlay fashion in licensed bands would cause "harmful interference" to some licensed CMRS services.

C. The Interference Temperature Concept Would Undermine The Rights Of Exclusive Use Licensees, Limit Flexibility, And Discourage Innovation.

Verizon Wireless also objects to the basic premise of the interference temperature and underlay concept, because it promotes unlicensed spectrum use at the expense of licensed services. The Task Force Report acknowledges the importance of spectrum

[29] Task Force Report at 29.

policies that are flexible and market-oriented.[30] The adoption of such policies will ensure the prompt delivery of service to the public, promote technical innovation, and ensure that the public's valuable spectrum resources are put to their highest valued uses. These ideals are embodied in the Commission's exclusive use licensing scheme that conveys spectrum use rights exclusively to a single licensee and generally permits the licensee to use its assigned spectrum in whatever manner it chooses, subject to interference restrictions. Unfortunately, this market-oriented spectrum model is likely to be severely undermined if the interference temperature and underlay concepts are implemented as proposed.

At the core of a licensee's spectrum rights is the right to protection from harmful interference. The Task Force Report espouses the importance of clearly and exhaustively defining a licensee's rights consistent with market-based principles,[31] but then proposes to strip away the most fundamental of those rights by allowing unlicensed devices to operate in the licensee's "exclusive use" spectrum while creating a significant potential for harmful interference.[32] Allowing unlicensed access to exclusively licensed spectrum pursuant to the proposed interference temperature and underlay model (aside from the legal invalidity of this approach) will ensure that the licensee will increasingly face "worst case" interference conditions.

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[30] *Id* at 15.

[31] Task Force Report at 17-18.

[32] The Task Force suggests that a licensee's flexibility in determining the highest valued use of its assigned spectrum should be "subject only to those rules that are necessary to afford reasonable opportunities for access by other spectrum users." Task Force Report at 16.

Since the interference temperature analyzes the "worst case" scenario for interference under current technology and spectrum usage conditions, it precludes the licensee from implementing new technologies that may improve spectral efficiency and providing communications at levels that may not be possible today. Consider the introduction of CDMA technology – designed to replace first generation analog technology – less than a decade ago. Due to the inherent processing gain of CDMA systems, receivers have the ability to operate at signal levels that were unattainable with analog systems (i.e., "below the noise floor"). If an interference temperature had been established based on the higher analog signal levels and unlicensed devices were permitted to operate up to this level, it is unlikely that CDMA would have ever developed and the increased efficiency of CDMA cellular networks would not have been realized.[33]

Another flaw in the Task Force Report is its assumption that advanced technologies are much more tolerant of interference than older technologies. As several commenters have indicated, this is not always true.[34] As discussed supra, CDMA systems are designed to maximize system capacity and spectral efficiency, and thus, operate closer to the performance limits. As a result, a CDMA system is likely to be more sensitive to interference than a signal from a less sophisticated system.

Verizon Wireless believes that mandatory underlays or easements in exclusive use spectrum create disincentives for operators to invest in advanced technologies that are more spectrally efficient, because it prevents the operator from making the most efficient and effective use of its licensed spectrum. In effect, it would yield any future increases in

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[33] Cingular Comments at 20.

[34] V-Comm Reply at 19-20; CTIA Comments at 12; Cingular Comments at 23.

efficiency to other unlicensed users in the band. We agree with other commenters that the Commission should limit any "easements" in exclusive use spectrum to those that are negotiated by the licensee in the secondary market.[35]

One example of such a secondary market arrangement is the service agreement that Verizon Wireless currently has with Aeris.net. Under this arrangement, Verizon Wireless provides Aeris.net with access to its analog setup channel to transmit short bursts of data when the channel is not being used.[36] While the analog setup channel is still required to support analog customers, it is used increasingly infrequently due to the rapid move to digital service. The data transmissions are under complete control of the cellular network, and thus, any potential interference to other cellular operations is managed effectively with other internal interference. Unlike the "opportunistic" uses contemplated in the Task Force Report, this application uses secondary market principles to promote the introduction of new services, increasing spectrum efficiency without any threat of harmful interference.

D. The Commission Should Undertake A Detailed Examination Of The Interference Environment.

Despite the flaws inherent in the proposed interference temperature model, Verizon Wireless believes that there is a need for a more quantitative approach to addressing interference. Prior to establishing a particular methodology, however, we urge the Commission to implement the recommendation of the Task Force to undertake a

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[35] *See* Comments of Nokia Inc. (filed Jan. 27, 2003) ("Nokia Comments"), in response to Task Force Report, at 6.

[36] Aeris.net provides a variety of services including vending machine monitoring, alarm systems, pipeline monitors, electric meter reading, and vehicle tracking under its MicroBurst® service brand. *See generally* at www.aeris.net.

systematic study of the RF noise floor.[37] Such an endeavor has received substantial support from numerous commenters and the Commission's own Technological Advisory Council.[38] The results of such a study would provide the Commission with significant information about the current RF environment, and provide useful guidance to the Commission as it considers the formulation of more quantitative interference standards.

III. THE COMMISSION SHOULD FAVOR THE "EXCLUSIVE USE" MODEL WHEN ALLOCATING SPECTRUM FOR NEW USES.

There is no doubt that market principles play an important role in spectrum management and that the existing spectrum management system can evolve to include much more flexible and market-oriented spectrum policies. One of the principle conclusions of the Task Force Report was the importance of the "exclusive use" model in spectrum management.[39] Specifically the Task Force noted that "where rights and responsibilities are clearly defined and effectively enforced, the characteristics of this model – e.g., exclusivity, flexibility, and transferability – generally provide a clear framework for market-based assignment and negotiation of access rights among spectrum users, thereby limiting transaction costs."[40] Moreover, the exclusive use model creates a more favorable environment for capital markets, provides incentives for operators to

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[37] Task Force Report at 5.

[38] V-Comm Reply at 36-37; AT&T Comments at 13; Cingular Comments at 31; Sprint Comments at 15; *see also* Comments of Public Safety Wireless Network (filed Jan. 27, 2003), in response to Task Force Report, at 9; FCC Technological Advisory Council II, *First Meeting Report*, at 8.

[39] Task Force Report at 5 and 37-39.

[40] *Id* at 38.

invest in network infrastructure, promotes innovation, and increases economic and spectral efficiency.[41]

We agree with the Report's conclusion that "[t]he excusive use model should be applied to most spectrum, particularly in bands where scarcity is relatively high and transaction costs associated with market-based negotiation of access rights are relatively low" and that the Commission should "focus primarily. . . .on using the exclusive use model" in bands below 5 GHz.[42]

However, it is also clear that, in order for a market for spectrum to function properly, the Commission must clearly define what "exclusive use" means, establish clear rights for such licensees and be vigilant in upholding those rights[43]. It is important that the Commission act on the Task Force's recommendation that it provide exclusive use licensees greater clarity as to the scope of their rights,[44] because this action will promote efficient operation of the spectrum market.[45]

Furthermore, several commenters note that such an "exclusive use" model is preferable to "underlays," "easements" or access rights for "opportunistic devices."[46] Such forced sharing policies would be antithetical to the very market-oriented approach

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[41] AT&T Comments at 4-5.

[42] Task Force Report at 38.

[43] AWS Comments at 3-5; Cingular Comments at 6-8; Sprint Comments at 8-12; CTIA Comments at 6-7.

[44] Task Force Report at 3-4.

[45] Commenters correctly identify the numerous legal flaws inherent in forced sharing, including conflicts with various provisions of Title III of the Communications Act. These multiple legal problems are ample grounds alone to terminate further consideration of forced sharing.

[46] AT&T Comments at 14-17; Cingular Comments at 20; Sprint Comments at 13-14.

the FCC purports to promote, because the potential for interference necessarily inhibits the ability of licensees to flexibly deploy future technologies and services, and because the uncertainty as to spectrum rights will distort and impede an efficient spectrum market. Under a forced sharing model, even after a final licensing decision, a licensee's rights to a particular set of frequencies are not certain, and the Commission can decide at any time to permit new entrants. This lack of certainty can have a chilling effect on government auctions as well as the secondary market for spectrum.[47] A company's willingness to bid on and purchase spectrum in a government auction is directly related to the rights it believes it is receiving.

We agree with the Report's conclusion that the Commission not only should provide certainty and clarify existing users' rights, but also give them the ability to sell or lease those rights to others.[48] In such an environment, if an entity is interested in offering a new mobile or fixed use in the PCS band, for example, it should seek a contractual arrangement with the PCS licensee. It should not need to or be permitted to petition the FCC for access to that spectrum. This policy would allow *licensees* to negotiate rights and decide what is an acceptable level of shared use. The Secondary Markets proceeding clearly contemplates such arrangements.[49] We agree with those commenters that an

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[47] This is not to say that the licensee should not be permitted to lease or sell such rights on the secondary market. The licensee is in the best position to understand the potential for interference to its existing customer base and make the necessary tradeoffs.

[48] Task Force Report at 6 and 57.

[49] *In the Matter of Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets ("Secondary Markets Proceeding")*, FCC 00-402, Notice of Proposed Rulemaking, at ¶¶ 24-62 (2000).

important first step in establishing clear rights for exclusive use licensees is for the Commission to complete this long-pending proceeding.[50]

IV. THE COMMISSION SHOULD ALLOCATE UNLICENSED SPECTRUM THAT IS SEPARATE FROM "EXCLUSIVE USE" SPECTRUM.

Verizon Wireless agrees with commenters that note the important role played by unlicensed devices.[51] There has been considerable development in this area in the past few years, and this development is likely to continue in the future.[52] The Commission should take appropriate action to ensure that sufficient spectrum is available, using the "Commons" approach, to support the continued development of unlicensed devices. There is some question, however, as to whether additional spectrum is needed.[53] As with regard to unmet needs for additional licensed spectrum, allocation of additional unlicensed spectrum should be made based on a record of demonstrated need.

As discussed supra, allowing unlicensed devices to operate in an underlay fashion in the same spectrum as licensed services is likely to result in substantial harmful interference to the licensed services. This can result in diminished service quality, reduced system coverage, decreased network capacity, and substantially increased cost to the licensed operator.[54] In addition, forced sharing through the underlay model would undermine the legal rights of exclusive use licensees, inhibit their ability to deploy

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[50] AT&T Comments at 18; Cingular Comments at 38; Sprint comments at 2-3.

[51] Cingular Comments at 39.

[52] *See* Comments of the Wi-Fi Alliance (filed Jan. 27, 2003) ("Wi-Fi Alliance Comments"), in response to the Task Force Report, at 2-3; *see also* Comments of Microsoft Corporation (filed Jan. 27, 2003) ("Microsoft Comments"), at 1-2.

[53] Cingular Comments at 39.

[54] *See* Section II supra.

innovative technologies in the future, and subvert the most efficient and effective use of licensed spectrum.

Even unlicensed devices are likely to be harmed by interference if they continue to proliferate without Commission regulation.[55] Proponents of unlicensed devices support this conclusion as well.[56] ScoreBoard recognizes the challenges and risks in the unlicensed bands from increased interference, noting "interference ultimately drives coverage, capacity, and service quality within a wireless network, and interference will grow proportionally with the increased usage of this finite spectrum resource."[57] It notes that Wi-Fi devices utilize spread spectrum technology to help mitigate interference, but that a technical solution "is not enough by itself."[58] As an example, it points to the deployment of unlicensed Wi-Fi devices in the 2.4 GHz band, and notes that there is a problem with interference in the band "caused by too many unlicensed devices operating within small geographical areas," and "the impact to the users of these devices is a loss or degradation of service."[59] It also notes "individuals and businesses making investments in this unlicensed technology ... need to have reasonable certainty their investment and

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[55] *Report of the Unlicensed Devices and Experimental Licenses Working Group (UEWG) to the Spectrum Policy Task Force* (rel. Nov. 15, 2002), at ¶ 23.

[56] Wi-Fi Alliance Comments at 5; Microsoft Comments at 4; *see also* Comments of ScoreBoard, Inc. (filed Jan. 27, 2003) ("ScoreBoard Comments"), in response to Task Force Report, at 2.

[57] ScoreBoard Comments at 2.

[58] *Id* at 7.

[59] *Id* at 3.

use will not be unreasonably disturbed by the very real potential chaos of unstructured proliferation."[60]

Verizon Wireless recognizes the potential for unlicensed Wi-Fi devices to be affected by harmful interference from other unlicensed devices. However, the harmful interference experienced by these devices will only be magnified if Wi-Fi devices were to operate in licensed bands that are already extremely congested. As a result, Verizon Wireless believes that the interests of licensed and unlicensed services are best promoted if they operate in separate bands of spectrum, to the greatest extent possible. At least one Wi-Fi proponent agrees that unlicensed devices would benefit from a separate, primary allocation for unlicensed devices.[61]

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[60] *Id* at 4.

[61] Microsoft Comments at 7.

CONCLUSION

Verizon Wireless urges the Commission to (1) act expeditiously to clearly and exhaustively define the rights of existing licensees, (2) as part of that effort protect licensees from harmful interference, and (3) continue its transition toward market-oriented spectrum policies, consistent with the comments outlined herein.

Respectfully submitted,

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Dated: February 28, 2003

Certificate of Service

I hereby certify that on this 24th day of February copies of the foregoing "Reply Comments of Verizon Wireless" in WT Docket 02-135 were sent by e-mail to the following parties:

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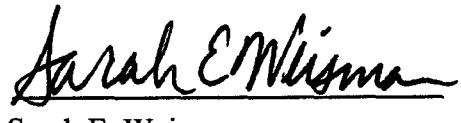

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